

# Jay D Keasling

**Positions** *Acting Deputy Laboratory Director, Lawrence Berkeley National Laboratory*  
*Chief Executive Officer, Joint BioEnergy Institute*  
*Hubbard Howe, Jr. Distinguished Professor of Biochemical Engineering,*  
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**Education** *Postdoctorate, Biochemistry, 1991-1992, Stanford University*  
*Ph.D., Chemical Engineering, 1991, University of Michigan*  
*M.S., Chemical Engineering, 1988, University of Michigan*  
*B.S., Chemistry and Biology, 1986, University of Nebraska, Lincoln*

**Professional Experience** *Chief Executive Officer (2007 – present), Joint BioEnergy Institute,*  
*Emeryville, CA. Acting Deputy Laboratory Director (2009 – present),*  
*Lawrence Berkeley National Laboratory, Berkeley, CA. Director (2005 –*  
*2009), Physical Biosciences Division, Lawrence Berkeley National*  
*Laboratory, Berkeley, CA. Senior Faculty Scientist (2006 – present),*  
*Faculty Scientist (1992 – 2006), Department Head (2003 – present),*  
*Synthetic Biology Department, Physical Biosciences Division, Lawrence*  
*Berkeley National Laboratory, Berkeley, CA. Professor (2001 – present),*  
*Vice Chair (1999 – 2000), Associate Professor (1998 – 2001), Assistant*  
*Professor (1992 – 1998), Department of Chemical Engineering, University*  
*of California, Berkeley, CA. Professor (2004 – present), Department of*  
*Bioengineering, University of California, Berkeley, CA. Director (2006 –*  
*2008), Synthetic Biology Engineering Research Center, University of*  
*California, Berkeley. Director, University of California Systemwide*  
*BioSTAR Project (2001 – 2003). Executive Committee Chair, University*  
*of California Discovery Grant Program (2003 – 2008). Associate Editor,*  
*Biotechnology & Bioengineering (2003 – 2005). Postdoctoral Research*  
*Associate, Department of Biochemistry, Stanford University School (1991 –*  
*1992). Research Assistant, Department of Chemical Engineering,*  
*University of Michigan (1986 – 1991).*

**Honors** *Inaugural Biotech Humanitarian Award, Biotechnology Industry*  
*Organization (BIO), 2009. 2009 University Lectures in Chemistry,*  
*Department of Chemistry, Boston College, 2009. The Sixteenth F. A.*  
*Bourke Distinguished Lecture in Biotechnology, Center for Advanced*  
*Biotechnology and Department of Biomedical Engineering, Boston*  
*University, 2009. Chancellor's Award for Public Service for Research in*  
*the Public Interest, University of California, Berkeley, 2009. 2008 Britton*  
*Chance Distinguished Lecturer, Department of Chemical and Biomolecular*  
*Engineering and Institute Medicine and Engineering, University of*  
*Pennsylvania, 2008. 2008 Patten Distinguished Seminar, Department of*  
*Chemical Engineering, University of Colorado, 2008. Sierra Section*  
*Recognition for Leadership in the Chemical Engineering Profession,*

American Institute of Chemical Engineers – Northern California Section, 2008. *Visionary Award*, Bay Bio, 2007. *Truman Lecturer*, Sandia National Laboratories, 2007. *Professional Progress Award*, American Institute for Chemical Engineers, 2007. Elected *Fellow of the American Academy for Microbiology*, 2007. *Research Project of the Year*, Northern California Section of the American Institute for Chemical Engineers, 2007. *Eastman Lectureship*, Department of Chemical Engineering, Georgia Tech University, 2007. *Scientist of the Year*, Discover Magazine, 2006. *Technology Pioneer*, World Economic Forum, 2005. *Seventh Annual Frontiers of Biotechnology Lecture*, Department of Chemical Engineering, Massachusetts Institute of Technology, 2005. *Blue-Green Lecturer*, Department of Chemical Engineering, University of Michigan & Department of Chemical Engineering and Materials Sciences, Michigan State University, 2005. *Inaugural Schwartz Lecturer*, Department of Chemical Engineering, Johns Hopkins University, 2003. *Allan P. Colburn Memorial Lecturer*, Department of Chemical Engineering, University of Delaware, 2002. Elected *Fellow of the American Institute of Medical and Biological Engineering*, 2000. *AIChE Award for Chemical Engineering Excellence in Academic Teaching*, Northern California Section of the American Institute for Chemical Engineers, 1999. *Chevron Young Faculty Fellowship*, Chevron, 1995. *CAREER Award*, National Science Foundation, 1995. *Zeneca Young Faculty Fellowship*, Zeneca Ltd., 1992-1997. *NIH Postdoctoral Fellowship*, Stanford University, 1991-1992. *Regents Scholarship*, The University of Nebraska, 1982-1986. *Graduation with High Distinction*, The University of Nebraska, 1986.

**Memberships**     Phi Beta Kappa, American Chemical Society, American Institute of Chemical Engineers, American Society for Microbiology, American Institute of Medical and Biological Engineering

#### **Refereed Journal Publications**

1. J. D. Keasling and B. O. Palsson. 1989. "On the kinetics of plasmid replication." *J. Theor. Biol.* **136**:487-492.
2. J. D. Keasling and B. O. Palsson. 1989. "ColE1 plasmid replication: a simple kinetic description from a structured model." *J. Theor. Biol.* **141**:447-461.
3. B. O. Palsson, J. D. Keasling, and S. G. Emerson. 1990. "The regulatory mechanisms of human immunodeficiency virus replication predict multiple expression rates." *Proc. Natl. Acad. Sci. USA.* **87**:772-776.
4. J. D. Keasling, B. O. Palsson, and S. Cooper. 1991. "Cell-cycle-specific F'*lac* plasmid replication: regulation by cell size control of initiation." *J. Bacteriol.* **173**:2673-2680.
5. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Replication of the R6K plasmid during the *Escherichia coli* cell cycle." *J. Bacteriol.* **174**:1060-1062.
6. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Replication of prophage P1 is cell-cycle specific." *J. Bacteriol.* **174**:4457-4462.
7. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Replication of mini-F plasmids during the bacterial division cycle." *Res. Microbiol.* **143**:541-548.
8. J. D. Keasling, L. Bertsch, and A. Kornberg. 1993. "Guanosine pentaphosphate phosphohydrolase of *Escherichia coli* is a long-chain polyphosphatase." *Proc. Natl. Acad. Sci. USA* **90**:7029-7033.
9. J. D. Keasling and S. Cooper. 1994. "Analysis of plasmid replication during the bacterial division cycle." *Methods in Molecular Genetics* **3**:380-388.
10. T. R. Hupp, J. D. Keasling, S. Cooper, and J. M. Kaguni. 1994. "Synthesis of DnaK protein during the division cycle of *Escherichia coli*." *Res. Microbiol.* **145**:99-109.
11. J. D. Keasling, H. Kuo, and G. Vahanian. 1995. "A Monte Carlo simulation of the *Escherichia coli* cell cycle." *J. Theor. Biol.* **176**:411-430.

12. J. D. Keasling and G. A. Hupf. 1996. "Genetic manipulation of polyphosphate metabolism affects cadmium tolerance in *Escherichia coli*." *Appl. Environ. Microbiol.* **62**:743-746.
13. S. T. Sharfstein, S. J. Van Dien, and J. D. Keasling. 1996. "Modulation of the phosphate-starvation response in *Escherichia coli* by genetic manipulation of the polyphosphate pathways." *Biotechnol. Bioeng.* **51**:434-438.
14. N. Shapiro and J. D. Keasling. 1996. "The *recA* gene and cadmium toxicity in *Escherichia coli* K-12." *Microbios* **86**:23-26.
15. H. Kuo and J. D. Keasling. 1996. "A Monte Carlo simulation of plasmid replication during the bacterial division cycle." *Biotechnol. Bioeng.* **52**:633-647.
16. S. Keyhani, J. L. Lopez, D. S. Clark, and J. D. Keasling. 1996. "Intracellular polyphosphate content and cadmium tolerance in *Anacystis nidulans* R2." *Microbios* **88**:105-114.
17. P. Wong, S. Gladney, and J. D. Keasling. 1996. "A mathematical model of the *lac* operon: inducer exclusion, catabolite repression, and diauxic growth on glucose and lactose." *Biotechnol. Prog.* **13**:132-143.
18. S. J. Van Dien, S. Keyhani, C. Yang, and J. D. Keasling. 1997. "Manipulation of independent synthesis and degradation of polyphosphate in *Escherichia coli* for investigation of phosphate secretion from the cell." *Appl. Environ. Microbiol.* **63**:1689-1695.
19. J. Elmen, W. Pan, S. Y. Leung, A. Magyarosy, and J. D. Keasling. 1997. "Kinetics of toluene degradation by a nitrate-reducing bacterium isolated from a groundwater aquifer." *Biotechnol. Bioeng.* **55**:82-90.
20. T. A. Carrier and J. D. Keasling. 1997. "Engineering mRNA stability in *E. coli* by the addition of synthetic hairpins using a 5' cassette system." *Biotechnol. Bioeng.* **55**:577-580.
21. C. L. Wang, P. C. Michels, S. Dawson, S. Kitisakkul, J. A. Baross, J. D. Keasling, and D. S. Clark. 1997. "Cadmium removal by a new strain of *Pseudomonas aeruginosa* in aerobic culture." *Appl. Environ. Microbiol.* **63**:4075-4078.
22. J. Pramanik and J. D. Keasling. 1997. "A stoichiometric model of *Escherichia coli* metabolism: incorporation of growth-rate dependent biomass composition and mechanistic energy requirements." *Biotechnol. Bioeng.* **56**:398-421.
23. T. A. Carrier and J. D. Keasling. 1997. "Controlling messenger RNA stability in bacteria: strategies for engineering gene expression." *Biotechnol. Prog.* **13**:699-708.
24. T. A. Carrier and J. D. Keasling. 1997. "Mechanistic modelling of mRNA decay." *J. Theor. Biol.* **189**:195-209.
25. J. D. Keasling, S. J. Van Dien, and J. Pramanik. 1998. "Engineering polyphosphate metabolism in *Escherichia coli*: implications for bioremediation of inorganic contaminants." *Biotechnol. Bioeng.* **58**:231-239.
26. S. J. Van Dien and J. D. Keasling. 1998. "A dynamic model of the *Escherichia coli* phosphate-starvation response." *J. Theor. Biol.* **190**:37-49.
27. J. D. Keasling and S.-W. Bang. 1998. "Recombinant DNA techniques for bioremediation and environmentally-friendly synthesis." *Current Biology* **9**:135-140.
28. S. Cooper and J. D. Keasling. 1998. "Cycle-specific replication of chromosomal and F-plasmid origins." *FEMS Microbiol. Lett.* **163**:217-222.
29. K. L. Jones and J. D. Keasling. 1998. "Construction and characterization of F plasmid-based expression vectors." *Biotechnol. Bioeng.* **59**:659-665.
30. T. A. Carrier, K. L. Jones, and J. D. Keasling. 1998. "mRNA stability and plasmid copy number effects on gene expression from an inducible promoter system." *Biotechnol. Bioeng.* **59**:666-672.
31. S. J. Van Dien and J. D. Keasling. 1998. "Optimization of polyphosphate degradation and phosphate secretion using hybrid metabolic pathways and engineered host strains." *Biotechnol. Bioeng.* **59**:754-761.
32. J. Pramanik, P. L. Trelstad, and J. D. Keasling. 1998. "A flux-based stoichiometric model of enhanced biological phosphorus removal metabolism." *Wat. Sci. Tech.* **37**:609-613.

33. J. Pramanik and J. D. Keasling. 1998. "Effect of carbon source and growth rate on biomass composition and metabolic flux predictions of a stoichiometric model." *Biotechnol. Bioeng.* **60**:230-238.
34. S. J. Van Dien and J. D. Keasling. 1998. "Control of polyphosphate metabolism in genetically-engineered *Escherichia coli*." *Enzyme Microb. Technol.* **24**:21-25.
35. J. Pramanik, P. L. Trelstad, A. J. Schuler, D. Jenkins, and J. D. Keasling. 1998. "Development and validation of a flux-based stoichiometric model for enhanced biological phosphorus removal metabolism." *Water Research* **33**:462-476.
36. R. Brent Nielsen and J. D. Keasling. 1999. "Reductive dechlorination of chlorinated ethene DNAPLs by a culture enriched from contaminated groundwater." *Biotechnol. Bioeng.* **62**:160-165.
37. T. A. Carrier and J. D. Keasling. 1999. "A library of synthetic 5' secondary structures to manipulate mRNA stability in *Escherichia coli*." *Biotechnol. Prog.* **15**:58-64.
38. E. Gilbert, A. Khlebnikov, W. Meyer-Ilse, and J. D. Keasling. 1999. "Use of soft X-ray microscopy for analysis of early-stage biofilm formation." *Wat. Sci. Tech.* **39**(7):269-272.
39. S. J. Van Dien and J. D. Keasling. 1999. "Effect of polyphosphate metabolism on the *Escherichia coli* phosphate-starvation response." *Biotechnol. Prog.* **15**(4):587-593.
40. S. E. Cowan, J. Black, J. D. Keasling, and R. M. White. 1999. "Ultrasonic flexural-plate-wave sensor for detecting the concentration of settling *E. coli* W3110 cells." *Analytical Chemistry*. **71**(16):3622-3625.
41. P. L. Trelstad, P. Purdhani, W. Geibdorfer, W. Hillen, and J. D. Keasling. 1999. "Polyphosphate kinase of *Acinetobacter* sp. Strain ADP1: purification and characterization of the enzyme and its role during changes in extracellular phosphate." *Appl. Environ. Microbiol.* **65**(9):3780-3786.
42. J. D. Keasling. 1999. "Gene-expression tools for the metabolic engineering of bacteria." *Trends in Biotechnology* **17**:452-460.
43. T. A. Carrier and J. D. Keasling. 1999. "Investigating autocatalytic gene expression systems through mechanistic modeling." *J. Theor. Biol.* **201**:25-36.
44. S. E. Cowan, E. Gilbert, A. Khlebnikov, and J. D. Keasling. 2000. "Dual labeling with green fluorescent proteins for confocal microscopy." *Appl. Environ. Microbiol.* **66**:413-418.
45. D. S. Reichmuth, J. L. Hittle, H. W. Blanch, and J. D. Keasling. 2000. "Biodesulfurization of dibenzothiophene in *Escherichia coli* is enhanced by expression of a *Vibrio harveyi* oxidoreductase gene." *Biotechnol. Bioeng.* **67**:72-79.
46. J. D. Keasling, S. J. Van Dien, P. Trelstad, N. Renninger, and K. McMahon. 2000. "Application of polyphosphate metabolism to environmental and biotechnological problems." *Biochemistry (Moscow)*. **65**:324-331.
47. D. G. Bolesch and J. D. Keasling. 2000. "The effect of monovalent ions on polyphosphate binding to *Escherichia coli* exopolyphosphatase." *Biochem. Biophys. Res. Comm.* **274**:236-241.
48. S.-W. Bang, D. S. Clark, and J. D. Keasling. 2000. "Engineering hydrogen sulfide production and cadmium removal by expression of the thiosulfate reductase gene (*phsABC*) from *Salmonella enterica* serovar Typhimurium in *Escherichia coli*." *Appl. Environ. Microbiol.* **66**:3939-3944.
49. C. L. Wang, P. D. Maratukulam, A. M. Lum, D. S. Clark, and J. D. Keasling. 2000. "Metabolic engineering of an aerobic sulfate reduction pathway and its application to precipitation of cadmium on the cell surface." *Appl. Environ. Microbiol.* **66**:4497-4502.
50. S. E. Cowan, E. Gilbert, D. Liepmann, and J. D. Keasling. 2000. "Commensal interactions in a dual-species biofilm exposed to mixed organic compounds." *Appl. Environ. Microbiol.* **66**:4481-4485.
51. S.-W. Bang, D. S. Clark, and J. D. Keasling. 2000. "Cadmium, lead, and zinc removal by expression of the thiosulfate reductase gene from *Salmonella typhimurium* in *Escherichia coli*." *Biotechnol. Lett.* **22**:1331-1335.
52. D. G. Bolesch and J. D. Keasling. 2000. "Polyphosphate binding and chain length recognition of *Escherichia coli* exopolyphosphatase." *J. Biol. Chem.* **275**:33814-33819.

53. A. Khlebnikov, O. Risa, T. Skaug, T. A. Carrier, and J. D. Keasling. 2000. "Regulatable arabinose-inducible gene expression system with consistent control in all cells of a culture." *J. Bacteriol.* **182**:7029-7034.
54. C. D. Smolke, T. A. Carrier, and J. D. Keasling. 2000. "Coordinated, differential expression of two genes through directed mRNA cleavage and stabilization by secondary structures." *Appl. Environ. Microbiol.* **66**:5399-5405.
55. K. L. Jones, S.-W. Kim, and J. D. Keasling. 2000. "Low-copy plasmids can perform as well as or better than high-copy plasmids for metabolic engineering of bacteria." *Met. Eng.* **2**:328-338.
56. S.-W. Kim and J. D. Keasling. 2001. "Metabolic engineering of the nonmevalonate isopentenyl diphosphate synthesis pathway in *Escherichia coli* enhances lycopene production." *Biotechnol. Bioeng.* **72**:408-415.
57. C. L. Wang, A. M. Lum, S. C. Ozuna, D. S. Clark, and J. D. Keasling. 2001. "Aerobic sulfide production and cadmium precipitation by *Escherichia coli* expressing the *Treponema denticola* cysteine desulphydrase gene." *Appl. Microbiol. Biotechnol.* **56**:425-430.
58. S. E. Cowan, D. Leipmann, and J. D. Keasling. 2001. "Development of engineering biofilms on poly-L-lysine patterned surfaces." *Biotechnol. Lett.* **23**:1235-1241.
59. I. Aldor and J. D. Keasling. 2001. "Metabolic engineering of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) composition in recombinant *Salmonella enterica* serovar Typhimurium." *Biotechnol. Bioeng.* **76**:108-114.
60. C. L. Wang, D. S. Clark, and J. D. Keasling. 2001. "Analysis of an engineered sulfate reduction pathway and cadmium precipitation on the cell surface." *Biotechnol. Bioeng.* **75**:285-291.
61. C. D. Smolke, V. J. J. Martin, and J. D. Keasling. 2001. "Controlling the metabolic flux through the carotenoid pathway using directed mRNA processing and stabilization." *Met. Eng.* **3**:313-321.
62. V. J. J. Martin, Y. Yoshikuni, and J. D. Keasling. 2001. "The in vivo synthesis of plant sesquiterpenes in *Escherichia coli*." *Biotechnol. Bioeng.* **75**:497-503.
63. C. D. Smolke, A. Khlebnikov, and J. D. Keasling. 2001. "Effects of transcription induction homogeneity and transcript stability on expression of two genes in a constructed operon." *Appl. Microbiol. Biotechnol.* **57**:689-696.
64. A. Khlebnikov, K. A. Datsenko, T. Skaug, B. L. Wanner, and J. D. Keasling. 2001. "Homogeneous expression of the P<sub>BAD</sub> promoter in *Escherichia coli* by constitutive expression of the low-affinity high-capacity AraE transporter." *Microbiology* **147**:3241-3247.
65. E. S. Gilbert, A. Khlebnikov, S. E. Cowan, and J. D. Keasling. 2001. "Analysis of biofilm structure and gene expression using fluorescence dual labeling." *Biotechnol. Prog.* **17**:1180-1182.
66. C. D. Smolke and J. D. Keasling. 2002. "Effect of copy number and mRNA processing and stabilization on transcript and protein levels from an engineered dual-gene operon." *Biotechnol. Bioeng.* **78**:412-424.
67. N. Renninger, K. D. McMahon, R. Knopp, H. Nitsche, D. S. Clark, and J. D. Keasling. 2002. "Uranyl precipitation by biomass from an enhanced biological phosphorus removal reactor." *Biodegradation* **12**:401-410.
68. C. L. Wang, S. C. Ozuna, D. S. Clark, and J. D. Keasling. 2002. "A deep-sea hydrothermal vent isolate, *Pseudomonas aeruginosa* CW961, requires thiosulfate for Cd<sup>2+</sup> tolerance and precipitation." *Biotechnol. Lett.* **24**:637-641.
69. A. W. Walker and J. D. Keasling. 2002. "Metabolic engineering of *Pseudomonas putida* for the utilization of parathion as a carbon and energy source." *Biotechnol. Bioeng.* **78**:715-721.
70. V. J. J. Martin, C. D. Smolke, and J. D. Keasling. 2002. "Redesigning cells for production of complex organic molecules." *ASM News* **68**:336-343.
71. A. Magyarosy, R. D. Laidlaw, R. Kilaas, C. Echer, D. S. Clark, and J. D. Keasling. 2002. "Nickel accumulation and nickel oxalate precipitation by *Aspergillus niger*." *Appl. Microbiol. Biotechnol.* **59**:381-388.

72. A. Magyarosy, J. Z. Ho, H. Rapoport, S. Dawson, J. Hancock, and J. D. Keasling. 2002. "Chloroxanthomycin, a fluorescent, chlorinated, pentacyclic pyrene from a *Bacillus* sp." *Appl. Environ. Microbiol.* **68**:4095-4101.
73. I. S. Aldor, S.-W. Kim, K. L. Jones, and J. D. Keasling. 2002. "Metabolic engineering of a novel propionate-independent pathway for the production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) in recombinant *Salmonella enterica* serovar Typhimurium." *Appl. Environ. Microbiol.* **68**:3848-3854.
74. A. Khlebnikov, T. Skaug, and J. D. Keasling. 2002. "Modulation of gene expression from the arabinose-inducible *araBAD* promoter." *J. Ind. Microbiol. Biotechnol.* **29**:34-37.
75. N. L. Goeden-Wood, V. P. Conticello, S. J. Muller, and J. D. Keasling. 2002. "Improved assembly of multimeric genes for the biosynthetic production of protein polymers." *Biomacromolecules* **3**:874-879.
76. A. Khlebnikov and J. D. Keasling. 2002. "Effect of *lacY* expression on homogeneity of induction from the P<sub>tac</sub> and P<sub>trc</sub> promoters by natural and synthetic inducers." *Biotechnol. Prog.* **18**:672-674.
77. K. D. McMahon, D. Jenkins, and J. D. Keasling. 2002. "Polyphosphate kinase genes from activated sludge carrying out enhanced biological phosphorus removal." *Water Sci. Technol.* **46**:155-162.
78. K. D. McMahon, M. A. Dojka, N. R. Pace, D. Jenkins, and J. D. Keasling. 2002. "Polyphosphate kinase from activated sludge performing enhanced biological phosphorus removal." *Appl. Environ. Microbiol.* **68**:4971-4978.
79. C. D. Smolke and J. D. Keasling. 2002. "Effect of gene location, mRNA secondary structures, and RNase sites on expression of two genes in an engineered operon." *Biotechnol. Bioeng.* **80**:762-776.
80. G.-Y. Wang and J. D. Keasling. 2002. "Amplification of HMG-CoA reductase production enhances carotenoid accumulation in *Neurospora crassa*." *Met. Eng.* **4**:193-201.
81. S. K. Tehara and J. D. Keasling. 2003. "Gene cloning, purification, and characterization of a phosphodiesterase from *Delftia acidovorans*." *Appl. Environ. Microbiol.* **69**:504-508.
82. E. S. Gilbert, A. W. Walker and J. D. Keasling. 2003. "A constructed microbial consortium for biodegradation of the organophosphorus insecticide parathion." *Appl. Microbiol. Biotechnol.* **61**:77-81.
83. N. L. Goeden-Wood, J. D. Keasling, and S. J. Muller. 2003. "Self-assembly of a designed protein polymer into  $\beta$ -sheet fibrils and responsive gels." *Macromolecules* **36**:2932-2938.
84. R. Knopp, P. J. Panak, L. A. Wray, N. S. Renninger, J. D. Keasling, and H. Nitsche. 2003. "Laser spectroscopic studies of U(VI) with bacterial phosphate species." *Chem. Eur. J.* **9**:2812-2818.
85. V. J. J. Martin, D. J. Pitera, S. T. Withers, J. D. Newman, and J. D. Keasling. 2003. "Engineering the mevalonate pathway in *Escherichia coli* for production of terpenoids." *Nat. Biotechnol.* **21**:796-802.
86. I. Chang, E. Gilbert, N. Eliashberg, and J. D. Keasling. 2003. "A three-dimensional, stochastic simulation of biofilm growth and transport-related factors that affect structure." *Microbiology* **149**:2859-2871.
87. D. J. Scott, B. M.T. da Costa, S. C. Espy, J. D. Keasling, and Katrina Cornish. 2003. "Activation and inhibition of rubber transferases by metal cofactors and pyrophosphate substrates." *Phytochemistry* **64**:123-134.
88. M.M. Maharbiz, W.J. Holtz, S. Sharifzadeh, J. D. Keasling, R. T. Howe. 2003. "A microfabricated electrochemical oxygen generator for high-density cell culture arrays." *IEEE J. Microelectromech. Syst.* **12**:590-599.
89. I. S. Aldor and J. D. Keasling. 2003. "Process design for microbial plastic factories: metabolic engineering of polyhydroxyalkanoates." *Curr. Opin. Biotechnol.* **14**:475-483.
90. C. Khosla and J. D. Keasling. 2003. "Metabolic engineering for drug discovery and development." *Nature Rev. Drug Disc.* **2**:1019-1025.
91. M. M. Maharbiz, W. J. Holtz, R. T. Howe, and J. D. Keasling. 2004. "Microbioreactor arrays with parametric control for high-throughput experimentation." *Biotechnol. Bioeng.* **86**:485-90.

92. E. S. Gilbert and J. D. Keasling. 2004. "Bench Scale Flow Cell for Nondestructive Imaging of Biofilms." *Meth. Microbiol.* **16**:109-118.
93. K. K. Reiling, Y. Yoshikuni, V. J. J. Martin, J. Newman, J. Bohlmann, and J. D. Keasling. 2004. "Mono and diterpene production in *Escherichia coli*." *Biotechnol. Bioeng.* **87**:200-212.
94. D. S. Reichmuth, H. W. Blanch, and J. D. Keasling. 2004. "Dibenzothiophene desulfurization pathway improvement using diagnostic GFP fusions." *Biotechnol. Bioeng.* **88**:94-99.
95. N. Renninger, R. Knopp, H. Nitsche, D.S. Clark, J. D. Keasling. 2004. "Uranyl precipitation by *Pseudomonas aeruginosa* via controlled polyphosphate metabolism." *Appl. Environ. Microbiol.* **70**:7404-7412.
96. B. M. T. da Costa, J. D. Keasling, and K. Cornish. 2005. "Regulation of rubber biosynthetic rate and molecular weight in *Hevea brasiliensis* by metal cofactor." *Biomacromolecules* **6**:279-289.
97. S. Cooper and J. D. Keasling. 2005. "Experimental and theoretical considerations of P1-plasmid replication and segregation during the *E. coli* cell cycle." *J. Biol. Sci.* **5**:222-229.
98. S. K. Lee, J. D. Newman, and J. D. Keasling. 2005. "Catabolite repression of the propionate catabolic genes in *Escherichia coli* and *Salmonella enterica*: Evidence for involvement of the cyclic AMP receptor protein." *J. Bacteriol.* **187**:2793-2800.
99. K. Wang, J. D. Keasling, and S. J. Muller. 2005. "Effects of the sequence and size of non-polar residues on self-assembly of amphiphilic peptides." *Int. J. Biol. Macromol.* **36**:232-240.
100. M. J. Kang, Y. M. Lee, S. H. Yoon, J. H. Kim, S. W. Ock, K. H. Jung, Y. C. Shin, J. D. Keasling, and S. W. Kim. 2005. "Identification of genes affecting lycopene accumulation in *Escherichia coli* using a shot-gun method." *Biotechnol. Bioeng.* **91**:636-642.
101. B. F. Pfleger, N. J. Fawzi, and J. D. Keasling. 2005. "Optimization of DsRed production in *Escherichia coli*: Effect of ribosome binding site sequestration on translation." *Biotechnol. Bioeng.* **92**:553-558.
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6. J.D. Keasling, J. Kirby, E. Paradise. 2004 "Metabolically Engineered Yeast for Terpene Production."
7. D.K. Ro, K. Newman, M. Chang, Y. Shiba, E. Paradise, J.D. Keasling, M. Ouellet, R. Eachus, K. Ho. 2005. "Biosynthesis of Artemisinic Acid, a Key Intermediate in the Artemisinin Pathway."
8. J.D. Keasling, S. Lee. 2005 "Inducible Expression Vectors and Methods of Use Thereof."
9. J.D. Keasling, J.D. Newman, D.J. Pitera. 2005. "Method for Enhancing Production of Isoprenoid Compounds."
10. Y. Shiba, J. Kirby, K.L. Newman, S.T. Withers, III, E. Paradise, J.D. Keasling. 2005. "Improvement of isoprenoid production level in yeast."
11. D.K. Ro, K. Newman, E. Paradise, J.D. Keasling, M. Ouellet, R. Eachus. 2005. "Polynucleotides Encoding Isoprenoid Modifying Enzymes and Methods of Use Thereof."
12. Y. Shiba, J. Kirby, E. M. Paradise, J.D. Keasling. 2005. "Genetically Modified Host Cells and Use of Same for Producing Isoprenoid Compounds."
13. J. Kirby, J.D. Keasling, A. Shaikh, M. Mattozzi, E. Paradise. 2005. "Engineering of the DXPP Pathway in Yeast for Isoprenoid Production."
14. M. Chang, R. Eachus, D.K. Ro, Y. Yoshikuni, J.D. Keasling. 2005. "Nucleic Acids Encoding Isoprenoid Precursor Modifying Enzymes and Methods of Use Thereof."
15. J. Keasling, C. Paddon, B. Pfleger, D. Pitera. 2006. "Nucleic Acids Encoding Modified Cytochrome P450 Enzymes and Methods of Use Thereof."
16. J. D. Keasling, F. Nowroozi, D. Pitera, J. D. Newman, J. Anthony, L. Anthony. 2006. "Determination of limiting genes in the Amorphadiene Pathway and development of Modular Vectors to facilitate this goal."
17. W.D. Marner II, A.S. Shaikh, J.D. Keasling, W.J. Holtz, S.T. Withers, J.L. Kizer. 2006. "A method for functionalizing proteins to incorporate auto-biosilification activity."
18. J.D. Keasling, J. Kirby. 2005. "Metabolically Engineered Yeast for Terpene Production."
19. D. Pitera, J.D. Newman, J.L. Kizer, J.D. Keasling, B. Pfleger. 2006. "Methods and Compositions for Modulating Fatty Acid Biosynthesis and Uses Thereof."
20. Y. Yoshikuni, J.D. Keasling. 2005. "Methods of generating protein variants with altered function."
21. J. A. Dietrich, Y. Yoshikuni, J.D. Keasling, M.C. Chang. 2006. "Production of artemisinic-11,12-epoxide by engineered cytochrome P450<sub>BM3</sub>."

### **Invited Presentations**

1. University of California at Davis, Department of Chemical Engineering, Davis, CA, May 1993
2. Genentech, South San Francisco, CA, January 1994.
3. Zeneca Bio-products, Billingham, England, November 1994.
4. University of California at Santa Barbara, Department of Chemical Engineering, Santa Barbara, CA, October, 1994.
5. Chiron, Emeryville, CA, May 1996.
6. Stanford University, Department of Chemical Engineering, Stanford, CA May 1997.
7. Society for Industrial Microbiology, National Meeting, Reno, NV, August 1997.
8. 7<sup>th</sup> Biochemical Engineering conference, Seoul, Korea, September 1997.
9. California Water Environment Association. 1998 Annual CWAE Conference. April 1998.
10. Merck and Co., July 1998.
11. Institute for Biological Engineering, Annual Meeting, Orlando, FL, July 1998.
12. California Institute of Technology, Department of Environmental Engineering Science, Pasadena, CA. September 30, 1998.
13. University of Wisconsin, Department of Chemical Engineering, Madison, WI. October 1998.

14. University of Michigan, Department of Chemical Engineering, Ann Arbor, MI. October 1998.
15. University of Michigan, Department of Microbiology and Immunology, Ann Arbor, MI. October 1998.
16. University of Toledo, Department of Bioengineering, Toledo, OH. January 1999.
17. Chiron, Emeryville, CA. June 1999.
18. Merck and Co., Bioprocess Research and Development. June 1999.
19. Enzyme Engineering XV, Kona, Hawaii. October 1999.
20. Massachusetts Institute of Technology, Department of Chemical Engineering. November 1999.
21. University of California at Irvine, Department of Chemical and Environmental Engineering. February 2000.
22. International symposium on Modern problems of Microbial Biochemistry and Biotechnology. Pushchino, Russia. June 2000.
23. International Society for Environmental Biotechnology meeting. Kyoto, Japan. July 2000.
24. Biotechnology 2000. Berlin, Germany. August 2000.
25. Princeton University, Department of Chemical Engineering. September 2000.
26. Metabolic Engineering and Directed Evolution. British Biotechnology Research Council. London, England. November 2000.
27. University of Minnesota, Department of Chemical Engineering. December 2000.
28. Pacifichem. Honolulu, Hawaii. December 2000.
29. World Congress on Enzyme Technologies. San Diego, CA. February 26, 2001.
30. American Society for Microbiology Annual Meeting. Orlando, FL. May 19, 2001.
31. Genomatica. San Diego, CA. October 26, 2001.
32. University College London, Department of Bioprocess Engineering. London, UK. October 22, 2001.
33. University of Wisconsin, Department of Chemical Engineering. Madison, WI. October 30, 2001.
34. Actinides 2001. Hayama, Japan. November 5, 2001.
35. Princeton University, Department of Chemical Engineering. Princeton, NJ. December 7, 2001.
36. Stanford University, Department of Civil and Environmental Engineering. Stanford, CA. February 8, 2002.
37. University of Maryland, Department of Chemical Engineering. College Park, Maryland. February 25, 2002.
38. Microbia. Cambridge, MA. February 27, 2002.
39. Diversa. San Diego, CA. March 13, 2002.
40. Kosan Biosciences. Hayward, CA. March 29, 2002.
41. University of Washington, Department of Chemical Engineering. Seattle, WA. April 22, 2002.
42. National Research Center, Biotechnology Research Institute. Montreal, Canada. June 3, 2002.
43. Sandia National Laboratory. August 27, 2002.
44. Tenth International Small Genomes Conference. Lake Arrowhead, CA. September 9, 2002.
45. City College of New York, Department of Chemical Engineering. New York, NY. September 30, 2002.
46. Polytechnic University, Department of Chemical Engineering. Brooklyn, NY. October 2, 2002.
47. University of Delaware, Department of Chemical Engineering (Allan P. Colburn Memorial Lecture). Newark, DE. November 2, 2002.
48. American Institute of Chemical Engineers National Meeting. Indianapolis, IN. November 5, 2002.
49. Firmenich. Geneva, Switzerland. November 7, 2002.
50. University of Michigan, Cellular Biotechnology Program. January 13, 2003.

51. Metabolic Engineering Working Group, National Science Foundation, Arlington, VA. January 31, 2003.
52. Synthetic Biology. SRI International. Menlo Park, CA. March 3-4, 2003.
53. University of California, San Diego, Department of Chemistry, La Jolla, CA. April 4, 2003.
54. Annual Meeting of the Society for Biochemistry and Molecular Biology (ASBMB), San Diego, CA. April 15, 2003.
55. Terpnet Meeting, University of Kentucky, Lexington, KY. May 15, 2003.
56. Johns Hopkins University, Department of Chemistry, Baltimore, MD. May 19, 2003.
57. Society of Industrial Microbiology Annual Meeting, Minneapolis, MN. August 10, 2003.
58. University of California, Berkeley, Department of Chemistry, Berkeley, CA. September 2, 2003.
59. University of Nebraska, Lincoln, Department of Chemistry, Lincoln, NE. September 12, 2003.
60. University of Illinois, Department of Chemical Engineering, Urbana-Champaign, IL. September 29, 2003.
61. Rice University, Department of Chemical Engineering, Houston, TX. October 9, 2003.
62. University of Colorado, Department of Chemical Engineering, Boulder, CO. October 14, 2003.
63. AIChE National Meeting, San Francisco, CA. November 17, 2003.
64. Thirteenth ISBA Meeting, Melbourne, Australia. December 1-5, 2003.
65. Eidgenossische Technische Hochschule, Department of Chemistry, Zurich, Switzerland. March 22, 2004.
66. PSI Protein Production and Crystallization Workshop, National Institute of General Medical Sciences, Natcher Conference Center, Bethesda, Maryland. March 29, 2004.
67. Illinois Institute of Technology, Department of Chemical Engineering, Chicago, IL. April 28, 2004.
68. Biotech Summit, Berkeley, CA. May 10, 2004.
69. Biological Input-Output Systems, DARPA, Boston MA. June 14, 2004.
70. Biotec 2004, Oviedo, Spain. July, 19, 2004.
71. Society for Industrial Microbiology, Anaheim, CA. July 25, 2004.
72. American Chemical Society, Philadelphia, PA. August 22, 2004.
73. Cornell University, Department of Chemical Engineering, Ithaca, NY. September 13, 2004.
74. Purdue University, Department of Chemical Engineering, West Lafayette, IN. September 14, 2004.
75. Metabolic Engineering V, Lake Tahoe, CA. September 19, 2004.
76. Small Genomes Meeting, Lake Arrowhead, CA. September 26, 2004.
77. Council for the Advancement of Science Writing, Fayetteville, AK. November 8, 2004.
78. BioAgenda, Palm Springs, CA. December 7, 2004.
79. The Crossroads of Biotechnology 2005, Montreal, Canada, February 8, 2005.
80. USDA-ARS Commercial Strategic Rubber from Crop Plants and Bioreactors Third Annual Meeting, Albany, CA. February 17-18, 2005.
81. SynBio 2005 International Conference, Seoul, Korea, February 23, 2005.
82. 229<sup>th</sup> ACS National Meeting, San Diego, CA. March 12, 2005.
83. American Society for Microbiology 105<sup>th</sup> General Meeting, Atlanta, GA. June 9, 2005.
84. Gordon Research Conference "Plant Metabolic Engineering", Tilton, NH. July 13-15, 2005.
85. International Union of Microbiological Societies (IUMS), San Francisco, CA. July 27, 2005.
86. Manipulation of Biological Systems Conference, McLean, VA. July 28, 2005.
87. 2005 SIMS Annual Meeting, Chicago, IL. August 22-23, 2005.
88. 13<sup>th</sup> Annual International Conference on Microbial Genomes, Madison, WI. September 13-15, 2005.
89. National Academy of Engineering 11<sup>th</sup> Annual US Frontiers of Engineering Symposium, Niskayuna, NY. September 22-24, 2005.

90. University of California, Santa Barbara, Department of Chemical Engineering, Santa Barbara, CA. October 6, 2005.
91. ICSB 2005, Boston, MA. October 20-22, 2005.
92. IBM Academy of Technology Annual Meeting, Burlingame, CA. November 2, 2005.
93. University of Michigan, Department of Chemical Engineering, East Lansing, MI. November 8-12, 2005.
94. Pacificchem 2005, Honolulu, Hawaii, December 16-18, 2005.
95. 2006 Institute of Biological Engineering Conference, Tucson, AZ. March 9-12, 2006.
96. University of Virginia, 2006 Symposium, Charlottesville, VA. April 10-11, 2006.
97. University of San Diego, San Diego, CA. April 13-14, 2006.
98. Stanford University, Stanford, CA. May 9, 2006.
99. DuPont Central Research and Development, Wilmington, DE. June 1-3, 2006.
100. CNN Future Summit "Of Man and Machine", Singapore, June 11-15, 2006.
101. IUCRP Fellows Seminar, UC San Diego, San Diego, CA, July 11, 2006.
102. SIMS 2006 Annual Meeting, Baltimore, MD, July 30-31, 2006.
103. California Commonwealth Club's INFORUM, San Francisco, CA. August 7, 2006.
104. Seminar, University of Minnesota, Dept. of Chemical Engineering and Material Sciences, Minneapolis, MN Sept. 11-12, 2006.
105. Seminar, University of California, Irvine, Synthetic Biology Department, Irvine, CA, Sept. 14-15, 2006.
106. 14<sup>th</sup> Annual International Meeting on Microbial Genomics, Lake Arrowhead, CA, September 24-28, 2006.
107. IBOS Conference, Nunspeet, The Netherlands, September 27 – 30, 2006.
108. Metabolic Engineering VI: From recDNA towards Engineering Biological Systems, Noordwijkerhout, The Netherlands, October 1-5, 2006.
109. UC Berkeley Homecoming Seminar, Berkeley, CA. October 6, 2006.
110. Contra Costa College, San Pablo, CA, October 13, 2006.
111. Invited Presentation, 3<sup>rd</sup> International *E. coli* Alliance Conference, Jeju, South Korea, November 1-3, 2006.
112. Seminar, IBM Almaden Research Center, San Jose, CA, November 7, 2006.
113. Invited Presentation, William L. Brown Symposium, Missouri Botanical Garden, St. Louis, MO. November 10-11, 2006.
114. Seminar, University of California, San Francisco, Department of Biophysics and Chemistry, San Francisco, CA, November 16, 2006.
115. Invited Presentation, Keystone Symposium, Drugs Against Protozoan Parasites, Lake Tahoe, CA, January 28, 2007.
116. Keynote Address, Biotechnology and Biological Sciences Research Council, BBSRC Workshop in Synthetic Biology, Alexandra House, Wroughton, Swindon, UK, February 8, 2007.
117. Seminar, Stanford University, Department of Microbiology, Stanford, CA, February 16, 2007.
118. Keynote Address, The World Congress on Industrial Biotechnology & Bioprocessing, Biotechnology Industry Organization, Orlando, FL, March 23, 2007.
119. Keynote Address, Joint Genome Institute User's Meeting, Walnut Creek, CA, March 28, 2007.
120. Seminar, University of Missouri, Columbia, Department of Biochemistry, Columbia, MO, April 13, 2007.
121. Panelist, Burrill General Partners Meeting, San Francisco, CA, April 17, 2007.
122. Keynote Address, Recomb 2007, Oakland, CA, April 23, 2007.
123. Seminar, Harvard Malaria Symposium, Harvard University, Cambridge, MA, April 24, 2007.
124. Seminar, Georgia Tech University, Center for the Study of Systems Biology, Atlanta, GA, May 2, 2007.
125. Seminar, Georgia Tech University, Department of Chemical Engineering, Atlanta, GA, May 3, 2007.
126. Seminar, Northern California AIChE, Berkeley, CA, May 15, 2007.



127. Seminar, University of British Columbia, Michael Smith Laboratories, Vancouver, British Columbia, Canada, May 17, 2007.
128. Seminar, Congressional Biomedical Research Caucus, Washington, D.C., May 23, 2007.
129. Seminar, PARC Forum, Palo Alto Research Center, Palo Alto, CA, May 24, 2007.
130. Seminar, Harvard University, Department of Chemistry, Cambridge, MA, May 31, 2007.
131. Seminar, Kavli Futures Symposium, Ilulissat, Greenland, June 13, 2007.
132. Seminar, University of Manchester, Manchester Institute of Biotechnology, Manchester, UK, July 12, 2007.
133. Presentation, Biochemical Engineering XV, Quebec City, Canada, July 12, 2007.
134. Presentation, Natural Products Gordon Research Conference, Tilton, NH, July 25, 2007.
135. Presentation, Society for Industrial Microbiology Meeting, Denver, CO, July 29, 2007.
136. Presentation, Energy Modeling Forum, Workshop on Climate Impacts and Integrated Assessment, Snowmass, CO, August 1, 2007.
137. Keynote Address, 10<sup>th</sup> Functional Genomics Meeting on Synthetic Biology, Goteborg, Sweden, August 28, 2007.
138. Presentation, KI International Symposium Future Design, Korean Advanced Institute for Science and Technology, Daejeon, Korea, September 6, 2007.
139. Keynote Address, Enzyme Engineering XIX, Harrison Hot Springs, British Columbia, Canada, September 23, 2007.
140. Presentation, Metabolic Engineering Meeting, Mathematical Biosciences Institute, Ohio State University, Columbus, OH, September 24, 2007.
141. Keynote Address, Frontiers in Transgenesis, Danforth Center, St. Louis, OH, September 28, 2007.
142. Seminar, Rice University, Department of Bioengineering, Houston, TX, October 10, 2007.
143. Presentation, Malaria Forum, Bill & Melinda Gates Foundation, Seattle, WA, October 17, 2007.
144. Presentation, Pop!Tech, Camden, ME, October 20, 2007.
145. Presentation, Energy Roundtable, Stanford University, Hoover Institute, Stanford, CA, November 20, 2007.
146. Presentation, Biological and Environmental Research Advisory Committee (BERAC), Washington, DC, November 29, 2007.
147. Harry S. Truman Award Lecture, Sandia National Laboratories, Albuquerque, NM, December 5, 2007.
148. Presentation, International Conference on Cellular & Molecular Bioengineering, Nanyang Technological University, Singapore, December 10, 2007.
149. Presentation, Symposium on Future Directions in Research at the Intersection of the Physical and Life Sciences (RIPLS), National Academy of Science, Washington, D.C., December 19, 2007.
150. Keynote Address, Technology Innovation Conference, Novozymes, Copenhagen, Denmark, January 13, 2008.
151. Presentation, US-EC Energy Symposium Exact Name, San Francisco, CA, February 22, 2008.
152. Keynote Address, 6<sup>th</sup> TLL Life Sciences Symposium, Temasek Life Sciences Laboratories, Singapore National University, Singapore, January 25, 2007.
153. Presentation, Orinda Intermediate School, Orinda, CA, January 30, 2007.
154. Keynote Address, 12<sup>th</sup> Netherlands Biotechnology Conference, Ede, The Netherlands, March 14, 2007.
155. Presentation, Symposium on Synthetic Biology, University of Arizona, Tucson, AZ, March 19, 2008.
156. Seminar, Duke University, Department of Biochemistry, Durham, NC, March 21, 2008.
157. Seminar, Reliance Life Sciences, Mumbai, India, March 28, 2008.
158. Seminar, Council of Scientific and Industrial Research, New Dehli, India, March 30, 2008.
159. Seminar, University of Nevada, Reno, Department of Chemical Engineering, Reno, NV, April 7, 2008.

160. Seminar, University of California, Berkeley, Department of Mechanical Engineering, Berkeley, CA, March 10, 2008.
161. Presentation, Targeting and Tinkering with Interaction Networks, Barcelona, Spain, April 15, 2008.
162. Presentation, Institute for Systems Biology, Seattle, WA, April 21, 2008.
163. Seminar, University of Washington, Department of Bioengineering, Seattle, WA, April 22, 2008.
164. Seminar, Sangamo Biosciences, Richmond, CA, April 25, 2008.
165. Presentation, Fifth Annual World Congress on Industrial Biotechnology & Bioprocessing, Chicago, IL, April 28, 2008.
166. Seminar, California Institute of Technology, Department of Bioengineering, Pasadena, CA, May 5, 2008.
167. Presentation, Khosla Ventures CEO Summit, location, May 7, 2008.
168. Seminar, Scripps Research Institute, Department of Chemistry, La Jolla, CA, May 8, 2008.
169. Seminar, Novozymes, Davis, CA, May 12, 2008.
170. Seminar, Harvard University Medical School, Department of Microbiology, May 27, 2008.
171. Presentation, Royal Society discussion on Synthetic Biology, London, UK, June 2, 2008.
172. Presentation, Burrill & Company, San Francisco, CA, June 10, 2008.
173. Presentation, CITRIS-Copenhagen Research Conference on Climate and Energy, Copenhagen, Denmark, June 18, 2008.
174. Presentation, 4<sup>th</sup> European Plant Science Organization Conference, Cote d'Azur, France, June 26, 2008.
175. Presentation, Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways, location, July 12, 2008.
176. Presentation, 13<sup>th</sup> Annual Human Genome Meeting: Genomics and the Future of Medicine, Hyderabad, India, September 28-30, 2008.
- 177.
178. Keynote Address: "Synthetic biology in pursuit of inexpensive, effective, anti-malarial drugs," EPSRC Centre for Synthetic Biology and Innovation, Imperial College, London, UK, May 12, 2009.

#### **Workshops, Panels, and Short Courses**

1. Massachusetts Institute of Technology, Department of Chemical Engineering. August 10-14, 1998. "Metabolic Engineering Short Course."
2. AIChE workshop on Bioinformatics. Houston, TX. March 13-14, 1999.
3. Massachusetts Institute of Technology, Department of Chemical Engineering. August 10-14, 1999. "Metabolic Engineering Short Course."
4. DARPA workshop on Metabolic Engineering. Washington, D.C. March 24 – 26, 2000.
5. Lawrence Berkeley National Laboratory Workshop "Solar to Fuel – Future Challenges and Solutions", Berkeley, CA. March 28-29, 2005.
6. 2005 Genomes to Life Program Workshop, Washington, DC. February 6-14, 2005.
7. Intercollegiate Genetically Engineered Machine Competition (iGEM) 2005 Teacher's Workshop, Boston, MA. May 14-15, 2005.
8. European Science Foundation Exploration Workshop, "Synthetic Biology: Constructing and Deconstructing Life" Arila, Spain. Oct. 13-16, 2005.

#### **Presentations at National or International Meetings**

1. J. D. Keasling, A. Joshi, and B. O. Palsson. 1987. "Towards rational design and exploitation of recombinant prokaryotic cells." *194th ACS National Meeting*, New Orleans, LA.
2. J. D. Keasling and B. O. Palsson. 1988. "Dynamics and control of vector replication." *196th ACS National Meeting*, Los Angeles, CA.
3. J. D. Keasling and B. O. Palsson. 1989. "Design in bacterial plasmids." *National AIChE Meeting*, San Francisco, CA.

4. J. D. Keasling, B. O. Palsson, and S. Cooper. 1990. "Cell-cycle-specific F<sup>'</sup>lac plasmid replication: regulation by cell size control of initiation." *European Molecular Biology Organization Meeting on the Bacterial Cell Cycle*, Collonges-La Rouge, France.
5. J. D. Keasling, S. Cooper, and B. O. Palsson. 1990. "Dynamics and control of plasmid replication." *AIChE National Meeting*, Chicago, IL.
6. S. Cooper and J. D. Keasling. 1991. "F plasmid replication: cell-cycle specificity, regulation by cell size control of initiation, and the relationship of different origins of replication to plasmid synthesis." *Human Frontier Science Program Workshop on Regulatory Mechanisms of DNA Replication*, Les Arcs, France.
7. J. D. Keasling and S. Cooper. 1991. "Cell-cycle-specificity, regulation by cell-size control of initiation, and the relationship of different origins of replication to plasmid synthesis." *American Society for Microbiology*, Dallas, TX.
8. S. Cooper and J. D. Keasling. 1991. "Synthesis and regulation of cytoplasm, DNA, cell surface, and plasmid during the bacterial division cycle." *Cold Spring Harbor Symposium on Quantitative Biology*, Cold Spring Harbor, NY.
9. S. Cooper and J. D. Keasling. 1991. "Cell-cycle-specific F plasmid replication during the *Escherichia coli* division cycle: regulation of replication by cell size control of initiation." *Gordon Conference on Extrachromosomal Elements*.
10. J. D. Keasling, S. Cooper, and B. O. Palsson. 1991. "Dynamics and Control of Bacterial Plasmid Replication." *AIChE National Meeting*, Los Angeles, CA.
11. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Plasmid Replication during the Cell Cycle." *Keystone Symposium on Molecular Mechanisms in DNA Replication and Recombination*, Taos, NM.
12. J. D. Keasling, L. Bertsch, A. Kornberg. 1993. "Guanosine pentaphosphate phosphohydrolase of *Escherichia coli* is a long-chain polyphosphatase." *205th ACS National Meeting*, Denver, CO.
13. J. D. Keasling, S. T. Sharfstein, B. Deaton, G. Hupf. 1993. "Engineering and phosphate and energy metabolism in micro-organisms." *Biochemical Engineering VIII*, Princeton, NJ.
14. D. G. Bolesch and J. D. Keasling. 1993. "Anaerobic bioremediation of TCE contamination in groundwater." *Zeneca Process Technology Conference*, Leeds, UK.
15. S. T. Sharfstein, B. Deaton, J. D. Keasling. 1993. "Engineering and phosphate and energy metabolism in micro-organisms." *207th American Chemical Society National Meeting*, San Diego, CA.
16. J. D. Keasling, H. Kuo, and G. Vahanian. 1994. "A probabilistic representation of the *Escherichia coli* cell cycle." *AIChE National Meeting*, San Francisco, CA.
17. S. T. Sharfstein, S. J. Van Dien and J. D. Keasling. 1994. "Engineering and phosphate and energy metabolism in micro-organisms." *AIChE National Meeting*, San Francisco, CA.
18. G. A. Hupf, N. Shapiro and J. D. Keasling. 1994. "Manipulation of phosphate and energy metabolism to improve heavy metal resistance and uptake." *AIChE National Meeting*, San Francisco, CA.
19. J. Pramanik and J. D. Keasling. 1994. "Mathematical analysis of fluxes through the metabolic pathways of *Escherichia coli*." *AIChE National Meeting*, San Francisco, CA.
20. R. Pape, P. Jorjani, and J. D. Keasling. 1994. "Design and construction of low-copy plasmids for metabolic engineering of *Escherichia coli*." *AIChE National Meeting*, San Francisco, CA.
21. D. Bolesch and J. D. Keasling. 1994. "Anaerobic bioremediation of chlorinated alkanes." *AIChE National Meeting*, San Francisco, CA.
22. D. Bolesch and J. D. Keasling. 1995. "Anaerobic bioremediation of chlorinated hydrocarbons." *In Situ and On-Site Bioreclamation*, San Diego, CA.
23. G. Hupf and J. D. Keasling. 1995. "Manipulation of phosphate and energy metabolism to improve heavy metal resistance and uptake." *In Situ and On-Site Bioreclamation*, San Diego, CA.

24. J. D. Keasling, S. Van Dien, S. Keyhani, S. Sharfstein. 1995. "Engineering polyphosphate metabolism in bacteria." *Biochemical Engineering VIII*, Davos, Switzerland.
25. P. C. Michels, J. A. Baross, J. D. Keasling, and D. S. Clark. 1995. "Bioremediation potential of newly isolated, metal-tolerant archaea." *Biochemical Engineering VIII*, Davos, Switzerland.
26. J. D. Keasling, S. Van Dien, S. Keyhani, D. Bolesch, and S. Sharfstein. 1995. "Redirection of phosphate and energy metabolism through polyphosphate pathways." *AIChE National Meeting*, Miami Beach, FL.
27. J. D. Keasling, D. Szykowny, and J. Elmen. 1995. "Degradation of aromatic hydrocarbons under denitrifying conditions." *AIChE National Meeting*, Miami Beach, FL.
28. R. Brent Nielsen and J. D. Keasling. 1996. "Anaerobic bioremediation of chlorinated hydrocarbons." Engineering Foundation meeting *Bioremediation of Surface and Subsurface Contamination* in Palm Coast, FL.
29. Joacim Elmen, Dave Szykowny, and J. D. Keasling. 1996. "Degradation of aromatic hydrocarbons under denitrifying conditions." Engineering Foundation meeting *Bioremediation of Surface and Subsurface Contamination* in Palm Coast, FL.
30. J. D. Keasling. 1996. "Metabolic engineering of polyphosphate metabolism in bacteria for phosphate and heavy metal bioremediation." Engineering Foundation meeting *Bioremediation of Surface and Subsurface Contamination* in Palm Coast, FL.
31. Jaya Pramanik and J. D. Keasling. 1996. "A flux-based model of metabolism: effect of biomass requirements and redirected pathways on central metabolism." *211th American Chemical Society National Meeting* in New Orleans, LA.
32. J. D. Keasling. 1996. "Metabolic engineering for bioremediation of inorganic pollutants" *Metabolic Engineering*, Danvers, MA.
33. R. B. Nielsen and J. D. Keasling. 1996. "Kinetic parameter evaluation and modeling of the anaerobic conversion of trichloroethene to ethene." *AIChE National Meeting*, Chicago, IL.
34. N. Eliashberg and J. D. Keasling. 1996. "Simulation of bacterial growth and substrate utilization in a polluted groundwater environment." *AIChE National Meeting*, Chicago, IL.
35. J. Pramanik and J. D. Keasling. 1996. "A flux-based metabolic model for bacteria: study of metabolic regulation and its sensitivity to biomass composition." *AIChE National Meeting*, Chicago, IL.
36. S. J. Van Dien and J. D. Keasling. 1996. "Engineering the polyphosphate levels in *Escherichia coli* and the effects on the phosphate-starvation response." *AIChE National Meeting*, Chicago, IL.
37. J. Pramanik, P. L. Trelstad, and J. D. Keasling. 1996. "Analysis of bioremediation processes using a flux-based metabolic model." *AIChE National Meeting*, Chicago, IL.
38. S. J. Van Dien and J. D. Keasling. 1997. "Engineering the polyphosphate levels in *Escherichia coli*: Effects of energy and phosphate starvation." *ACS National Meeting*, San Francisco, CA.
39. R. B. Nielsen and J. D. Keasling. 1996. "Anaerobic biodegradation of chlorinated hydrocarbons by groundwater microorganisms." *ACS National Meeting*, San Francisco, CA.
40. J. Pramanik, P. L. Trelstad, and J. D. Keasling. 1996. "Analysis of the metabolism of enhanced biological phosphorus removal using a fluxed-based metabolic model." *ACS National Meeting*, San Francisco, CA.
41. J. D. Keasling. 1997. "In situ bioremediation of chlorinated and aromatic hydrocarbons in groundwater: application of modern molecular and mathematical tools." *Biochemical Engineering X*, Kananaskis, Canada.
42. J. D. Keasling. 1997. "Development of tools for the metabolic engineering of bacteria." *Biochemical Engineering X*, Kananaskis, Canada.
43. J. D. Keasling, J. Pramanik, J. Benemann. 1997. "Metabolic engineering for hydrogen fermentations." *Biohydrogen '97*, Kona, Hawaii.

44. N. Eliashberg and J. D. Keasling. 1997. "Simulation of spacial heterogeneity development in a mutualistic mixed species biofilm." *AIChE National Meeting*, Los Angeles, CA.
45. R. B. Nielsen and J. D. Keasling. 1997. "Kinetics of anaerobic biodegradation of chlorinated ethenes." *AIChE National Meeting*, Los Angeles, CA.
46. T. A. Carrier and J. D. Keasling. 1997. "Mechanistic modelling of prokaryotic mRNA decay." *AIChE National Meeting*, Los Angeles, CA.
47. S. J. Van Dien and J. D. Keasling. 1997. "Engineering polyphosphate metabolism in *Escherichia coli*." *AIChE National Meeting*, Los Angeles, CA.
48. K. L. Jones and J. D. Keasling. 1997. "Construction, stability, and expression of low-copy vectors derived from the *E. coli* F plasmid." *AIChE National Meeting*, Los Angeles, CA.
49. T. A. Carrier, K. L. Jones, and J. D. Keasling. 1997. "mRNA stability and plasmid copy number effects on gene expression from an inducible promoter system." *AIChE National Meeting*, Los Angeles, CA.
50. R. B. Nielsen and J. D. Keasling. 1998. "Anaerobic degradation of PCE and TCE DNAPLs by groundwater microorganisms." *Remediation of Chlorinated and Recalcitrant Compounds*, Monterey, CA.
51. E. Gilbert, A. Khlebnikov, W. Meyer-Ilse and J.D. Keasling. 1998. "Use of soft X-ray microscopy for analysis of early stage biofilm formation." *Microbial Ecology of Biofilms: Concepts, Tools and Applications. International Association on Water Quality (IAWQ)*, Lake Bluff, IL.
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